

CORRIGENDA TO “CALCULATION OF THE REGULATOR OF $\mathbb{Q}(\sqrt{D})$ BY USE OF THE NEAREST INTEGER CONTINUED FRACTION ALGORITHM”

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ABSTRACT. There are some minor errors in one of the algorithms and two of the tables in a paper by Williams and Buhr. These errors do not affect the major conclusions of the paper.

We present corrections to one of the algorithms and two of the tables in [1]. These corrections do not affect the major conclusions of the paper.

In the algorithm for computing the NICF of \sqrt{D} on the bottom half of page 373, when $Q'_k < 0$, T_k should be defined as

- If $Q'_k + F + 1$ is even, then $T_k = d + \lfloor (|Q'_k| + F + 1)/2 \rfloor$.
- If $Q'_k + F + 1$ is odd, then $T_k = 1 + d + \lfloor (|Q'_k| + F + 1)/2 \rfloor$.

R'_{k+1} should be defined as

- If $Q'_{k+1} < 0$ and Q'_{k+1} divides $P'_{k+1} + T_{k+1}$ evenly, then $R'_{k+1} = |Q'_{k+1}|$.
- Otherwise, R'_{k+1} is, as in [1], the remainder on dividing $P'_{k+1} + T_{k+1}$ by Q'_{k+1} .

Note that the formula for R'_{k+1} has to be used with $k = -1$ in order to set the value of R'_0 . In the other formulas in this algorithm $k \geq 0$. Also, $P'_{k+1} = T_k - R'_k$.

The description of Table 1 in [1] should read, “In Table 1 we give the frequency of occurrence of each of these criteria for the NICF expansion of \sqrt{D} for each nonsquare $10 \leq D < M$.” Corrected values for the Table 1 in [1] are given in “Table 1 (with corrections)”.

TABLE 1 (with corrections)

Condition	$M = 10,000$	$M = 100,000$	$M = 1,000,000$	$M = 10,000,000$
1	7,370	76,155	776,894	7,882,803
2	880	9,698	101,347	1,032,817
3	324	2,340	18,093	146,161
4	785	6,819	60,702	552,135
5	153	1,302	11,734	106,995
6	382	3,363	30,224	275,920

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The corrected Table 1 agrees with that in [1] for $M = 10,000$, but most of the values to 100,000 and to 1,000,000 in the corrected table are slightly different from those in [1]. We have added counts to 10 million.

In Table 2 of [1] each Θ should be 2Θ . For Case 6, the $\log(\sqrt{D} + |Q'_{\rho-1}/2|)$ in [1] should be $\log(\sqrt{D} - |Q'_{\rho-1}/2|)$.

REFERENCES

- [1] H. C. Williams and P. A. Buhr, *Calculation of the regulator of $\mathbf{Q}(\sqrt{D})$ by use of the nearest integer continued fraction algorithm*, Math. Comp. **33** (145) (1979), 369–381. MR514833 (80e:12003)

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